



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,748	03/02/2007	Wolfram Schmid	095309.57193US	1676
23911 7590 09/20/2007 CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			EXAMINER COLEMAN, KEITH A	
			ART UNIT 3709	PAPER NUMBER
			MAIL DATE 09/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/560,748

Applicant(s)

SCHMID ET AL.

Examiner

Keith A. Coleman

Art Unit

3709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 1-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/15/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

Art Unit: 3709

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 18, 27, and 36 are objected to because of the following informalities: In claim 18, "operatable" is misspelled and should be "operable" and in claims 27 and 36, "operateable" is misspelled and should be "operable". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 25, 32, 33, and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 25 recites the limitation of a variable turbine geometry in claim 22. Claims 32 and 34 recite the limitation of a variable turbine geometry in claim 29. Claim 33 recites the limitation of a variable turbine geometry in claim 30. There is insufficient antecedent basis for these limitations in the claims.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 18, 19, 21, 27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Rothe (US Patent No. 3,217,487).

With regards to claim 18, the patent to Rothe discloses an internal combustion engine having an exhaust gas recirculation device and cylinder groups (Col. 1, Lines 15-20, Figure 2), whereby exhaust gas from each cylinder group is dischargeable separately via respective exhaust pipes (Col. 1, Lines 15-20, Figure 2), wherein a recirculation line of the exhaust gas recirculation device branches (17, Col. 2, Lines 30-35, Figure 3) and opens out into an induction section of the internal combustion engine (Col. 1, Lines 15-20) and the cylinder groups are arranged to be operated with an identical or different power output (See Col. 1, Lines 24-30, Col. 2, Lines 55-60), and the recirculation line branches off from one of the exhaust operable with a higher power output in at least one operating point (See Col. 1, Lines 24-30, Col. 2, Lines 55-60). Due to the inherent functionality of the exhaust system and the turbine driven supercharger, Rothe discloses that a high-speed engine corresponds to a high supercharger speed (Col. 1, Lines 26-30) and later Rothe discloses that the supercharger's speed is a function of the quantity of exhaust gases i.e. the inherent characteristic of a turbocharger and the output of a turbocharged engine. Thus, as shown in both Figures 2 and 3, when both valves 24 and 25 are opened or closed (via common weighted lever 28, Col. 2, Lines 48-52), the cylinder groups are operating at an identical power output. Rothe's inherent engine function is further explained by disclosing that the pressures in the exhaust manifolds are substantially equalized by the

Art Unit: 3709

two separate valves working in unison (Col. 2, Lines 55-57). In the latter case, when both are not opened or closed (Col. 2, Lines 56-59), the cylinder groups are operating at different power outputs (See Col. 1, Lines 24-30) and Rothe discloses that the cylinder groups are out-of-phase and pressures differences are found in the exhaust manifolds (Col. 2, Lines 61-63). Again, due to the inherent nature of the turbine-driven supercharger, the cylinder groups are operating at different power outputs due to pressure differences.

With regards to claim 19, the patent to Rothe discloses wherein specific power of cylinders of one cylinder group differs from specific power of the cylinders of another cylinder group (See Figures 2 and 3). It should be noted that when both are not opened or closed, the cylinder groups are operating at a different power output (See Col. 1, Lines 24-30). Due to the inherent functionality of the exhaust system and the turbine driven supercharger, Rothe discloses that a high speed engine corresponds to a high supercharger speed (Col. 1, Lines 26-30) and later Rothe discloses that the supercharger's speed is a function of the quantity of exhaust gases i.e. the inherent characteristic of a turbocharger and the output of a turbocharged engine. As explained above, when both are not opened or closed (Col. 2, Lines 56-59), the cylinder groups are operating at different power outputs (See Col. 1, Lines 24-30) and Rothe discloses that the cylinder groups are out-of-phase and pressures differences are found in the exhaust manifolds (Col. 2, Lines 61-63). Again, due to the inherent nature of the

Art Unit: 3709

turbine-driven supercharger, the cylinder groups are operating at different power outputs due to pressure differences.

With regards to claims 21 and 29, the patent to Rothe discloses wherein an exhaust gas turbine (8, Figures 1-3) of an exhaust gas turbocharger is operatively arranged in the exhaust section (via manifolds 16 and 17) such that the exhaust pipes are feedable to the exhaust gas turbine (8, See Figures 2 and 3).

With regards to claim 27, the patent to Rothe discloses an internal combustion engine having an exhaust gas recirculation device and cylinder groups (Col. 1, Lines 15-20, Figure 3), in which exhaust gas from each cylinder group is dischargeable separately via respective exhaust pipes (Figures 2 and 3), comprising a recirculation line of the exhaust gas recirculation device branches and opens out into an induction section of the internal combustion engine (Figure 3, via intake manifold 17 connected to compressor 9 and exhaust manifold 17 connected to turbine 8), and the cylinder groups are arranged to be selectively operated with an identical or different power output (Col. 1, Lines 24-30), wherein the cylinder groups are operable with different air/fuel ratios (Col. 1, Lines 32-36), and the recirculation line exhaust gas recirculation device branches off from one of the exhaust pipes associated with the cylinder group operable with a lower air/fuel ratio in at least one operating point (Figure 3, via intake manifold 17 connected to compressor 9 and exhaust manifold 17 connected to turbine 8). It should

be noted that when both valves 24 and 25 are opened or closed, the cylinder groups are operating at an identical power output. When both are not opened or closed, the cylinder groups are operating at a different power output (See Col. 1, Lines 24-30) and different air/fuel ratios (Col. 1, Lines 32-36). Due to the inherent functionality of the exhaust system and the turbine driven supercharger, Rothe discloses that a high speed engine corresponds to a high supercharger speed (Col. 1, Lines 26-30) and later Rothe discloses that the supercharger's speed is a function of the quantity of exhaust gases i.e. the inherent characteristic of a turbocharger and the output of a turbocharged engine. Thus, as shown in both Figures 2 and 3, when both valves 24 and 25 are opened or closed (via common weighted lever 28, Col. 2, Lines 48-52), the cylinder groups are operating at an identical power output. Rothe's inherent engine function is further explained by disclosing that the pressures in the exhaust manifolds are substantially equalized by the two separate valves working in unison (Col. 2, Lines 55-57). In the latter case, when both are not opened or closed (Col. 2, Lines 56-59), the cylinder groups are operating at different power outputs (See Col. 1, Lines 24-30) and Rothe discloses that the cylinder groups are out-of-phase and pressures differences are found in the exhaust manifolds (Col. 2, Lines 61-63). Again, due to the inherent nature of the turbine-driven supercharger, the cylinder groups are operating at different power outputs due to pressure differences.

6. Claims 35-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Evans et al. (US Patent No. 4,249,382).

With regards to claim 35, the patent to Evans et al. discloses discharging exhaust gas from each cylinder group separately via a respective exhaust pipe (Figure 2), wherein a recirculation line of the exhaust gas recirculation device branches off from one of the exhaust pipes and opens into an induction section of the internal combustion engine (Figure 2), and selectively operating the cylinder groups with an identical or different power output, such that one of the cylinder groups, whose exhaust pipe is connected to the recirculation line is operated with a variable power output (Abstract).

With regards to claim 36, the patent to Evans et al. discloses wherein the cylinder groups are operable with different air/fuel ratios (Col. 6, Lines 8-15, Claim 4 from Evans et al.), and the cylinder group whose exhaust pipe is connected to the recirculation line is operable with a variable air/fuel ratio (Col. 6, Lines 8-15, Claim 4 from Evans et al.). By way of the electronic governor control (44), Evans et al. discloses that when fuel-to-air ratio is overly high, the controller (44) cuts off recirculation and when the airflow reaches a proper or low air/fuel ratio, the controller reestablishes flow. The manipulation of the airflow via the controller (44) inherently causes a variable air/fuel ratio.

With regards to claim 37, the patent to Evans et al. discloses wherein the air/fuel ratio is reduced by increasing a fuel proportion (Col. 6, Lines 8-15). It should be noted that reducing the amount of air inherently increases the fuel proportion.



Art Unit: 3709

With regards to claim 38, the patent to Evans et al. discloses wherein different ignition points are set in the cylinder groups (Col. 3, Lines 5-11, Col. 3, Lines 60-65, Figure 5). It should be noted that ignition points are changed as the fuel rate or engine load is increased or decreased.

With regards to claim 39, the patent to Evans et al. discloses wherein different fuel injection profiles are set in the cylinder groups (Col. 3, Lines 5-11, Col. 3, Lines 60-65, Figure 5).

With regards to claim 40, the patent to Evans et al. discloses wherein an air proportion is reduced to decrease the air/fuel ratio (Col. 6, Lines 8-15).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 3709

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 22, 23, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothe (US Patent No. 3,217,487) in view of Halimi et al. (US Patent No. 5,560,208).

With regards to claims 22 and 30, the patent to Rothe discloses all the limitations of the claimed subject matter except wherein the exhaust gas turbine is of two-flow configuration, with each exhaust gas flow of the exhaust gas turbine being operatively connected to a respective one of the exhaust pipes. The patent to Halimi et al. discloses wherein the exhaust gas turbine (22, Col. 4, Lines 60-64) is of two-flow configuration (via volutes 18 and 20, Figure 1, Col. 4, Lines 60-64), with each exhaust gas flow of the exhaust gas turbine being operatively connected to a respective one of

Art Unit: 3709

the exhaust pipes (via exhaust manifolds 14 and 16, Figure 1, Col. 4, Lines 60-64). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the exhaust and turbine of Rothe with a two-flow configuration in view of the teaching to Halimi et al., in order to enhance performance (Col. 3, Lines 20-25).

With regards to claims 23 and 31, the patent to Rothe further discloses wherein exhaust gas flows are of different sizes (See Figure 3, Col. 2, Lines 35-39), a smaller of the exhaust gas flows being connected to the exhaust pipe (19) associated with the exhaust gas recirculation device (28, Col. 2, Lines 49-51, Figure 3). As shown in Figure 3, the exhaust pipes 18 and 19 are smaller than pipe 17.

11. Claims 20, 24, 25, 26, 28, 32, 33, and 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothe (US Patent No. 3,217,487) in view of Evans et al. (US Patent No. 4,249,382).

With regards to claim 20, the patent to Rothe discloses cylinder groups. Rothe does not disclose the cylinder groups comprising a different number of cylinders. Evans et al. discloses cylinder groups comprising a different number of cylinders (Figure 2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the cylinder groups of Rothe with a different number of cylinders in

Art Unit: 3709

view of the teaching to Evans et al., in order to recirculate exhaust gas in to the inlet manifold (Col. 1, Lines 10-20).

With regards to claim 24, the patent to Rothe discloses an exhaust gas turbine. Rothe does not disclose a variable turbine geometry arrangement for adjustably setting an active turbine inlet cross-section. Evans et al. discloses a variable turbine geometry arrangement for adjustably setting an active turbine inlet cross-section (Col. 4, Lines 1-5, Figure 2). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the exhaust gas turbine of Rothe with a variable turbine geometry in view of the teaching to Evans et al., in order to reduce back pressure and sufficient boost (Col. 4, Lines 1-5).

With regards to claim 25 and to further prosecution, the patent to Rothe discloses all the limitations of the claimed subject matter except a variable turbine geometry arrangement in association with a turbine inlet cross-section of each of the exhaust gas flows. The patent to Evans et al. discloses a variable turbine geometry arrangement in association with a turbine inlet cross-section of each of the exhaust gas flows (Col. 4, Lines 1-5, Figure 2).

With regards to claim 26 and to further prosecution, the patent to Rothe discloses all the limitations of the claimed subject matter except a variable turbine geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow

associated with the exhaust gas recirculation device. The patent to Evans et al. discloses a variable turbine geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow associated with the exhaust gas recirculation device (Col. 4, Lines 1-5, Figure 2).

With regards to claim 28, the patent to Rothe discloses all the limitations of the claimed subject matter except wherein the cylinder group associated with the exhaust gas recirculation device comprises a smaller number of cylinders than another cylinder group, which is independent of the exhaust gas recirculation device. Evans et al. discloses wherein the cylinder group associated with the exhaust gas recirculation device comprises a smaller number of cylinders than another cylinder group which is independent of the exhaust gas recirculation device (Figure 2).

With regards to claim 32 and to further prosecution, the patent to Rothe discloses all the limitations of the claimed subject matter except wherein the exhaust gas turbine has a variable turbine geometry arrangement for adjustably setting an active turbine inlet cross-section. Evans et al. discloses wherein the exhaust gas turbine has a variable turbine geometry arrangement for adjustably setting an active turbine inlet cross-section (Col. 4, Lines 1-5, Figure 2).

With regards to claim 33 and to further prosecution, the patent to Rothe discloses all the limitations of the claimed subject matter except wherein the variable turbine

Art Unit: 3709

geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow associated with the exhaust gas recirculation device. Evans et al. discloses wherein the variable turbine geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow associated with the exhaust gas recirculation device (Col. 4, Lines 1-5, Figure 2).

With regards to claim 34 and to further prosecution, the patent to Rothe discloses all the limitations of the claimed subject matter except wherein the variable turbine geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow associated with the exhaust gas recirculation device. Evans et al. discloses wherein the variable turbine geometry arrangement is associated with the turbine inlet cross-section of the exhaust gas flow associated with the exhaust gas recirculation device (Col. 4, Lines 1-5, Figure 2).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Remmels et al. (US Patent No. 6,752,132) shows the current state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith A. Coleman whose telephone number is 571-270-3516. The examiner can normally be reached on Monday through Friday between 8-5 Eastern Time.

Art Unit: 3709

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrence Till can be reached on (571) 272-1280. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Terrence R. Till  
Supervisory Patent Examiner

KAC

